FIG. 1A

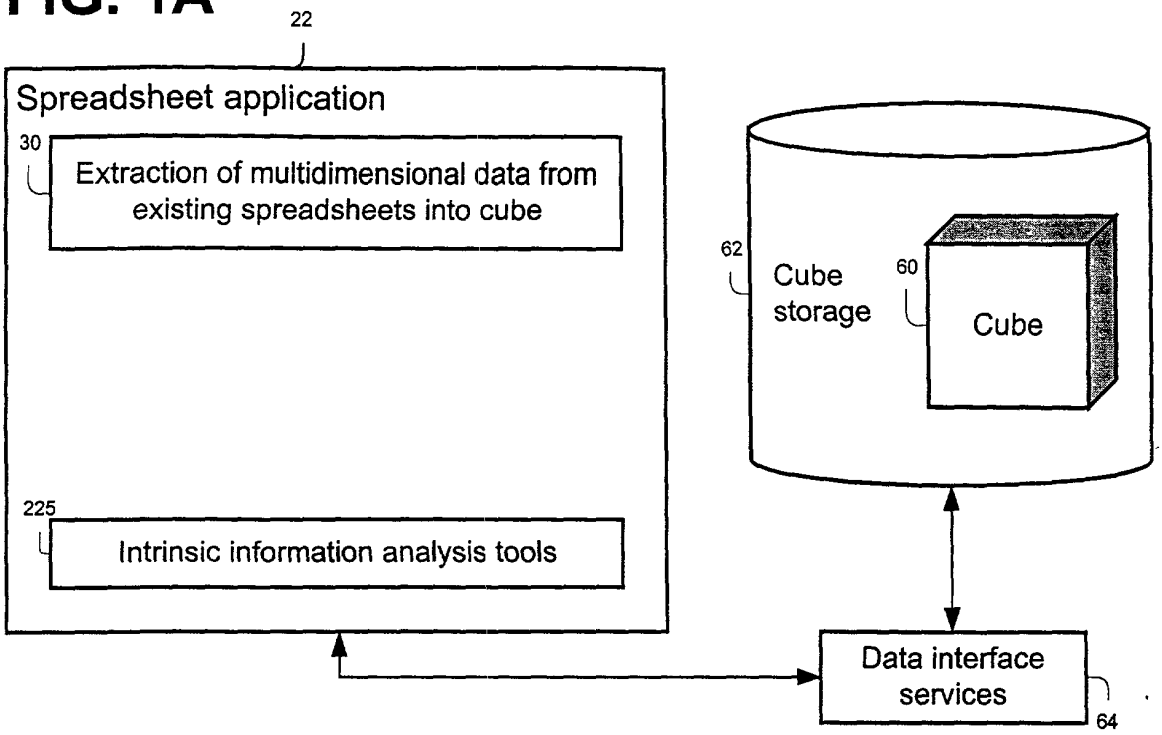

22
Spreadsheet application
30
Extraction of multidimensional data from existing spreadsheets into cube
225
Intrinsic information analysis tools
62
Cube storage
60
Cube
Data interface services
64

FIG. 1B

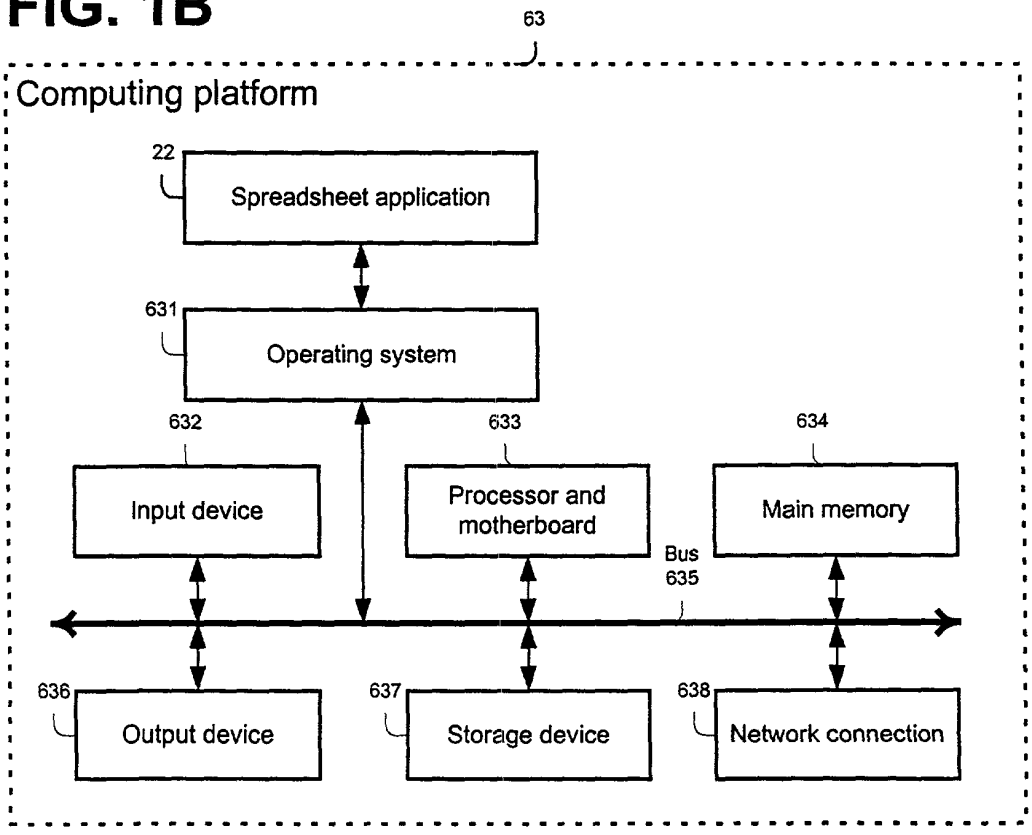

63
Computing platform
22
Spreadsheet application
631
Operating system
632
Input device
633
Processor and motherboard
634
Main memory
Bus
635
636
Output device
637
Storage device
638
Network connection

FIG. 1C

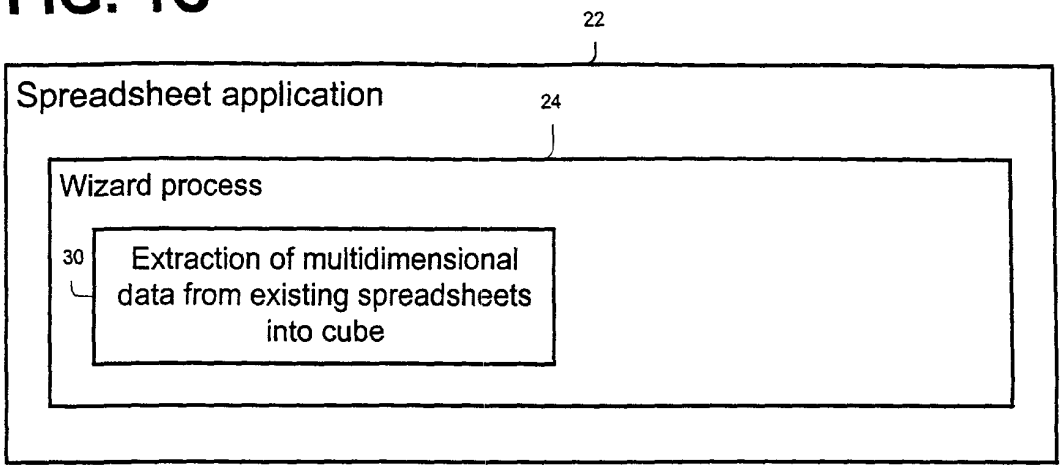

22
Spreadsheet application
24
Wizard process
30
Extraction of multidimensional data from existing spreadsheets into cube

FIG. 1D

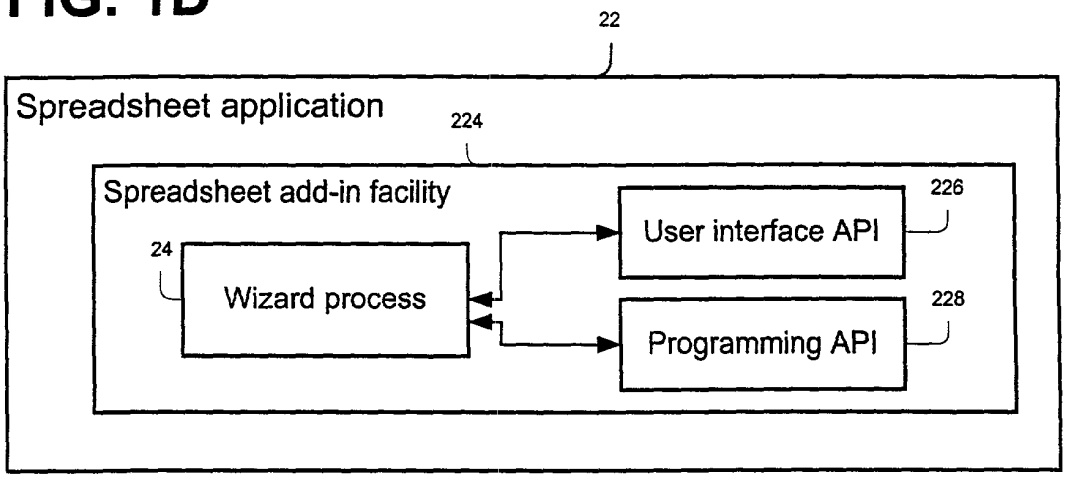

22
Spreadsheet application
224
Spreadsheet add-in facility
24
Wizard process
User interface API
226
Programming API
228

FIG. 2

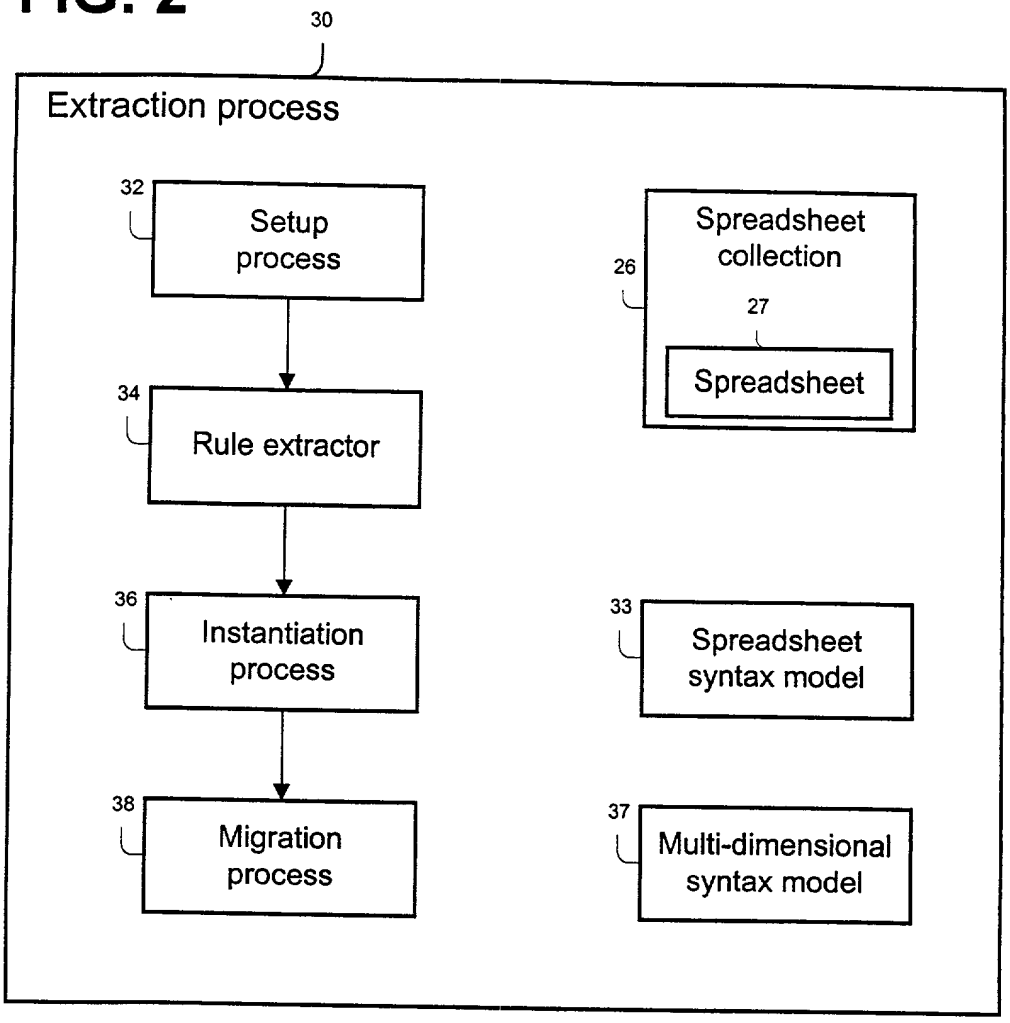

30
Extraction process
32
Setup process
34
Rule extractor
36
Instantiation process
38
Migration process
26
Spreadsheet collection
27
Spreadsheet
33
Spreadsheet syntax model
37
Multi-dimensional syntax model

FIG. 3

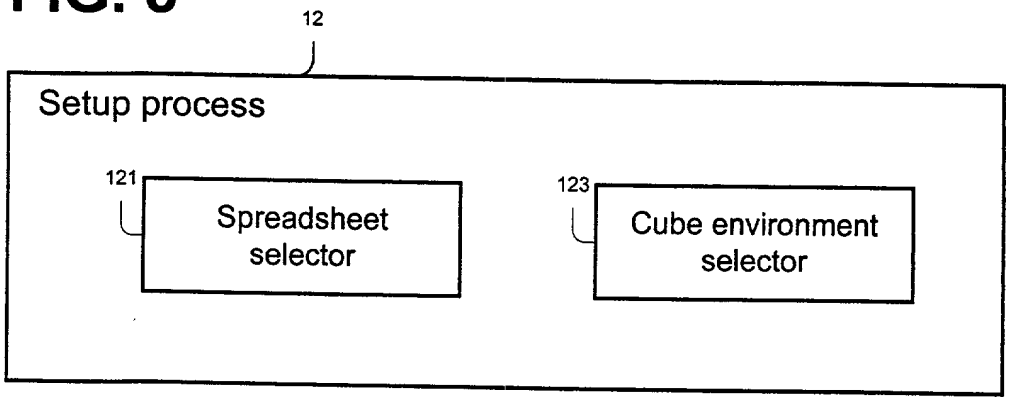

12
Setup process
121
Spreadsheet selector
123
Cube environment selector

FIG. 4

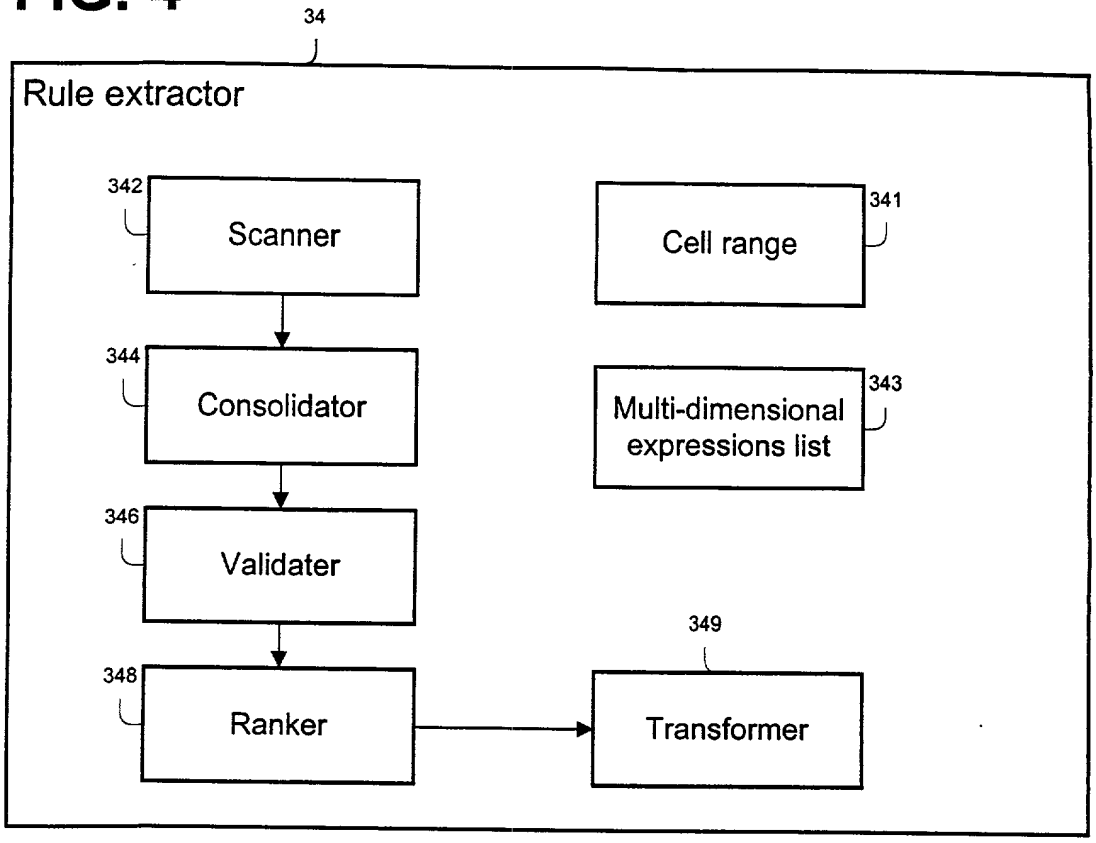

34
Rule extractor
342
Scanner
344
Consolidator
346
Validater
348
Ranker
341
Cell range
343
Multi-dimensional expressions list
349
Transformer

FIG. 5

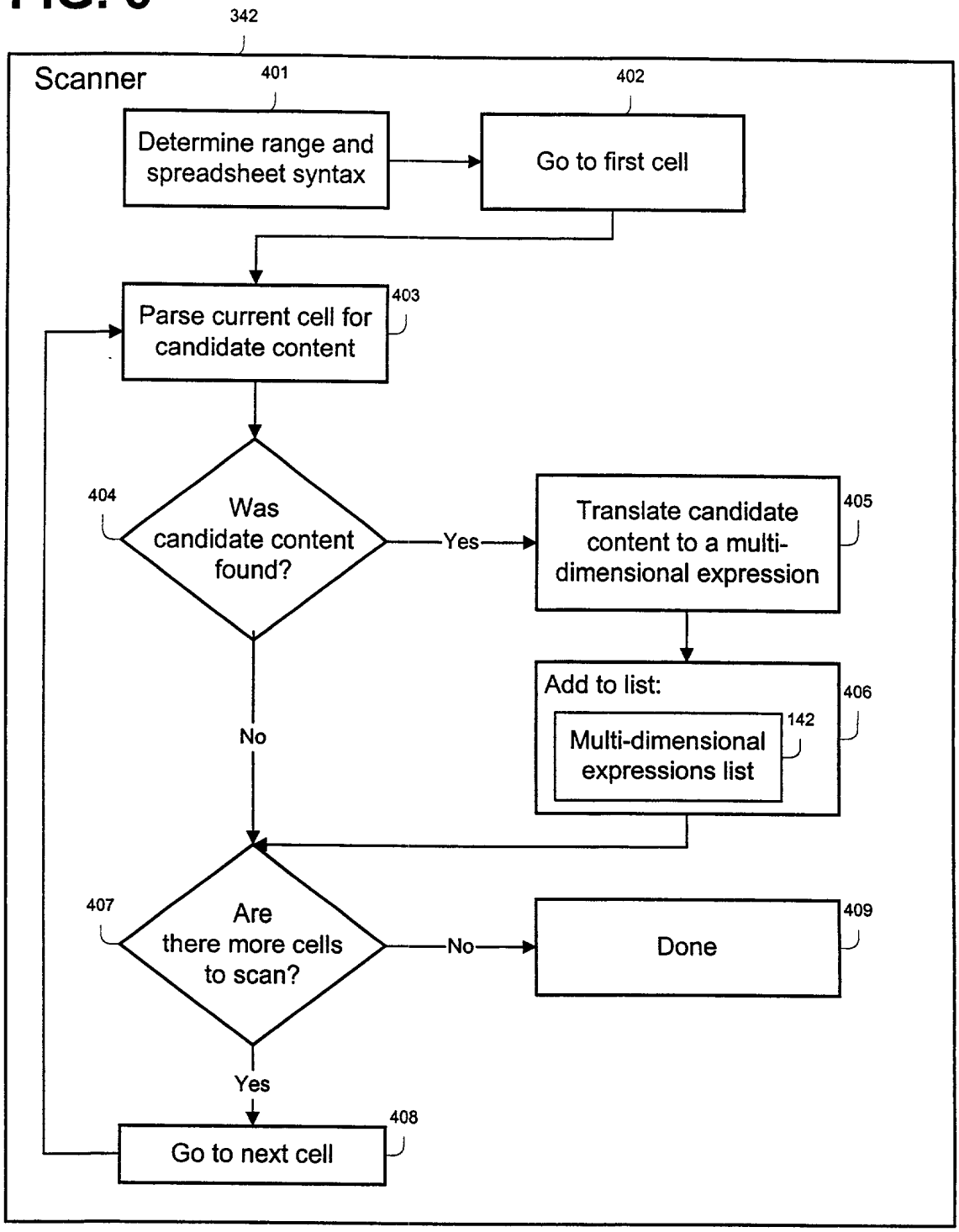

342
Scanner
401
Determine range and spreadsheet syntax
402
Go to first cell
403
Parse current cell for candidate content
404
Was candidate content found?
Yes
405
Translate candidate content to a multi-dimensional expression
406
Add to list:
142
Multi-dimensional expressions list
No
407
Are there more cells to scan?
No
409
Done
Yes
408
Go to next cell

FIG. 6

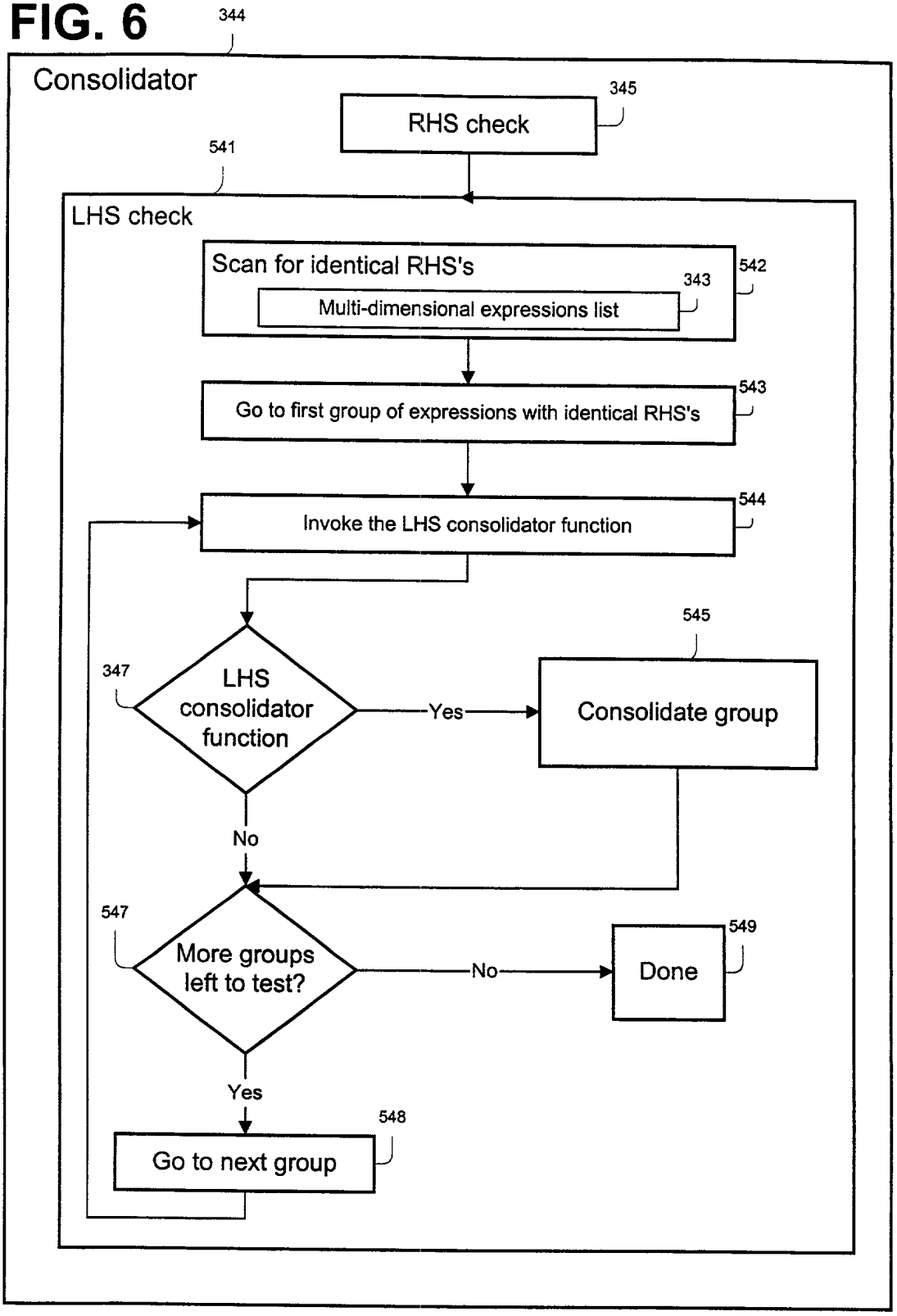

344
Consolidator
345
RHS check
541
LHS check
Scan for identical RHS's
542
343
Multi-dimensional expressions list
543
Go to first group of expressions with identical RHS's
544
Invoke the LHS consolidator function
545
347
LHS consolidator function
Yes
Consolidate group
No
547
More groups left to test?
No
549
Done
Yes
548
Go to next group

FIG. 7

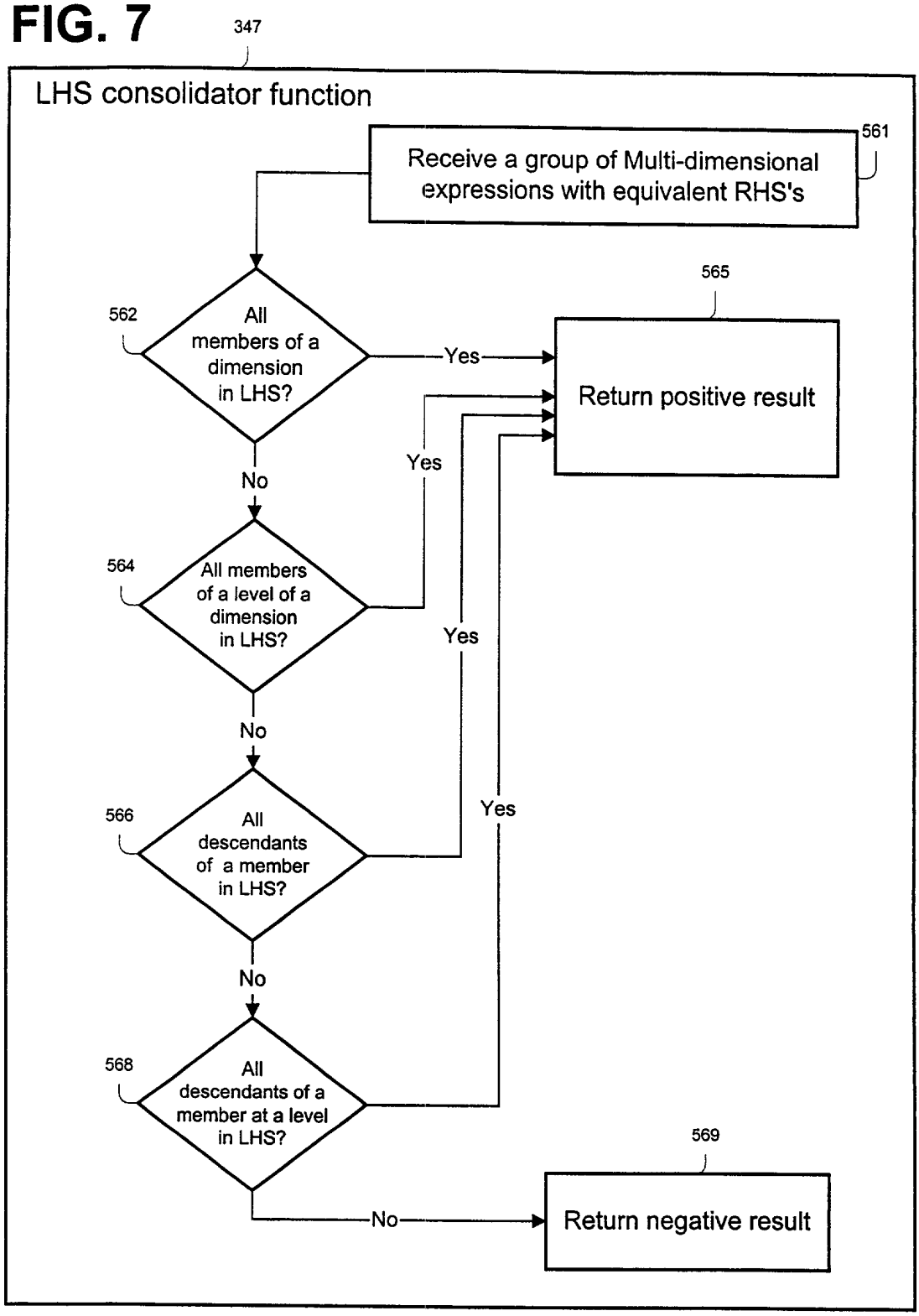

347
LHS consolidator function
Receive a group of Multi-dimensional expressions with equivalent RHS's
561
562
All members of a dimension in LHS?
Yes
565
Return positive result
No
564
All members of a level of a dimension in LHS?
Yes
Yes
No
566
All descendants of a member in LHS?
Yes
No
568
All descendants of a member at a level in LHS?
569
No
Return negative result

FIG. 8A

Example of (Spreadsheet 27) with cells showing displayed values

94a

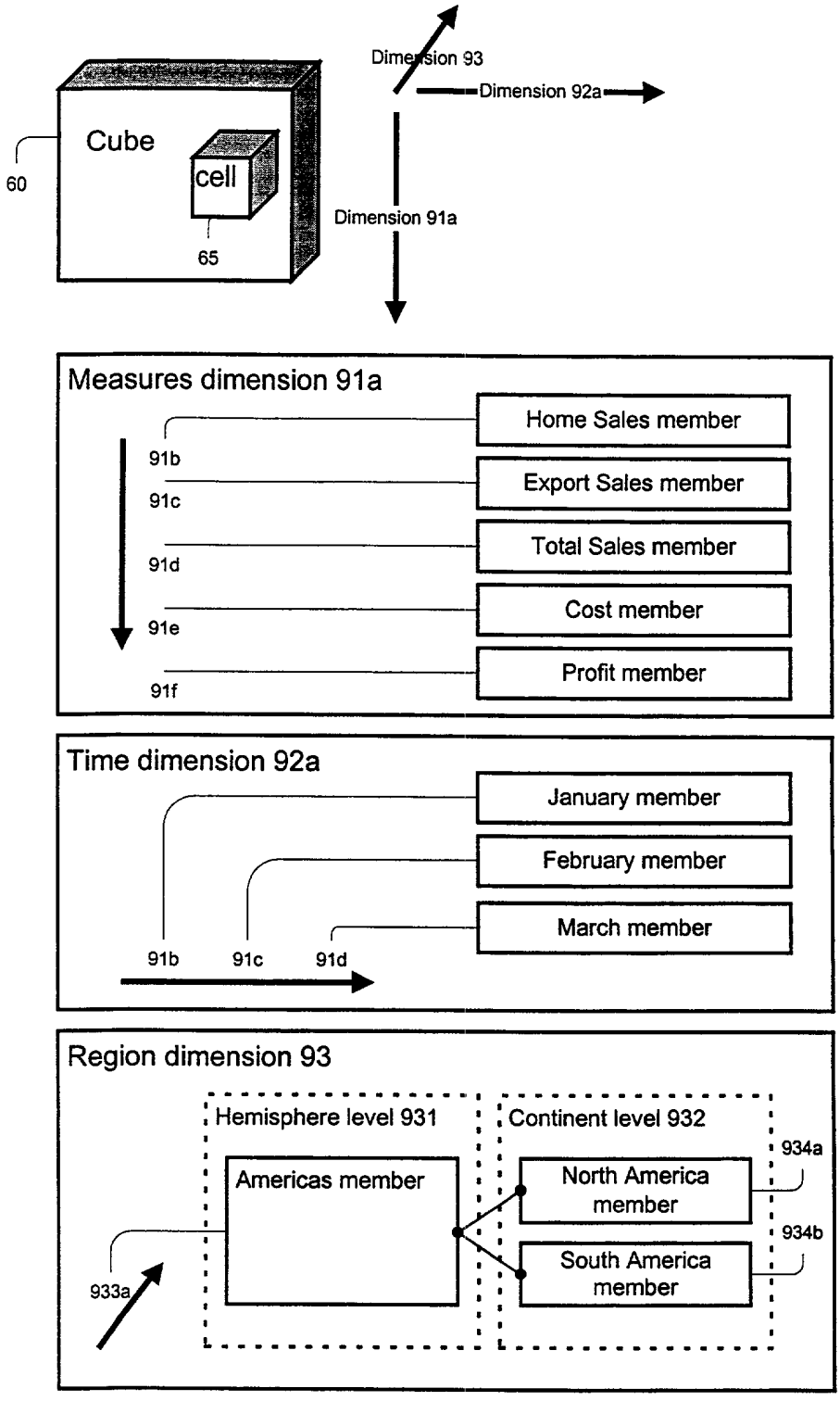
	B	C	D	E	F
4			Jan	Feb	Mar
5	North America				
6		Home Sales	250	235	267
7		Export Sales	500	485	524
8		Total Sales	750	720	791
9		Cost	610	595	580
10		Profit	140	125	211
11	South America				
12		Home Sales	125	120	115
13		Export Sales	250	220	225
14		Total Sales	375	340	340
15		Cost	270	255	260
16		Profit	105	85	80
17	Americas				
18		Home Sales	375	355	382
19		Export Sales	750	705	749
20		Total Sales	1125	1060	1131
21		Cost	880	850	840
22		Profit	245	210	291

FIG. 8B

Example (Spreadsheet 27) with cell descriptions replacing displayed values

94b

	B	C	D	E	F
4			Jan	Feb	Mar
5	North America				
6		Home Sales	**Fact value**	**Fact value**	**Fact value**
7		Export Sales	**Fact value**	**Fact value**	**Fact value**
8		Total Sales	**SUM(D6:D7)**	**SUM(E6:E7)**	**SUM(F6:F7)**
9		Cost	**Fact value**	**Fact value**	**Fact value**
10		Profit	**D8-D9**	**E8-E9**	**F8-F9**
11	South America				
12		Home Sales	**Fact value**	**Fact value**	**Fact value**
13		Export Sales	**Fact value**	**Fact value**	**Fact value**
14		Total Sales	**SUM(D12:D13)**	**SUM(E12:E13)**	**SUM(F12:F13)**
15		Cost	**Fact value**	**Fact value**	**Fact value**
16		Profit	**D14-D15**	**E14-E15**	**F14-F15**
17	Americas				
18		Home Sales	**D6+D12**	**E6+E12**	**F6+F12**
19		Export Sales	**D7+D13**	**E7+E13**	**F7+E13**
20		Total Sales	**D8+D14**	**E8+E14**	**F8+F14**
21		Cost	**D9+D15**	**E9+E15**	**F9+F15**
22		Profit	**D10+D16**	**E10+E16**	**F10+F16**

FIG. 9

Some example elements of a (cube 60)